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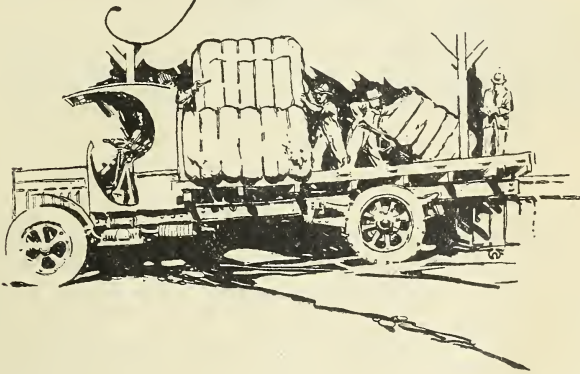
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U. S. DEPARTMENT OF  
AGRICULTURE

MISCELLANEOUS CIRCULAR No. 43

LESSONS ON  
COTTON  
*for*  
ELEMENTARY SCHOOLS



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# UNITED STATES DEPARTMENT OF AGRICULTURE

## MISCELLANEOUS CIRCULAR NO. 43

WASHINGTON, D. C.

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### LESSONS ON COTTON FOR ELEMENTARY SCHOOLS

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#### INTRODUCTION

These outlines of lessons on cotton are intended as aids in teaching the subject in the seventh or eighth grades of elementary schools. They should be especially helpful to teachers in rural consolidated schools, where facilities for handling the subject are generally better than in the ordinary one-room country school. However, the teachers in one-room schools should find much of this material useful, since their needs also have been kept in mind in the preparation of the outlines. The lessons furnish only special features of the subject and are not intended to be exhaustive, since it is expected that the teacher and pupils will have at least one elementary textbook of agriculture.

The teacher should make a special effort to obtain the farmers' bulletins referred to in this publication and should keep them on file in the school for ready reference. Publications from the local State college of agriculture and other sources bearing upon the subject should be obtained as far as practicable.

The lessons do not follow a logical order, but are arranged according to seasons, beginning with the opening of the fall term. As far as possible the instruction in the school and the home projects should follow the regular round of operations on the farm. The project should comprise not less than 1 acre of cotton.

The "home project" is a definite piece of work embracing a cycle of productiveness that shall be completed in a definite period of time. The term as applied to elementary agriculture implies (1) a selected, definite piece of work to be done at home; (2) close correlation of this work with the agricultural instruction of the school; (3) carefully kept records of time, cost, and income concerning the project undertaken; and (4) a full report of the project work submitted to the teacher.



FIG. 1.—A desirable type of cotton plant

It is not expected that the teacher will in every case be able to cover all the topics suggested in each lesson, but a careful selection should be made of such topics as there are time and opportunity to teach clearly and in such manner as to make a distinct impression on the mind of the pupil and to stimulate his interest in the subject. The general order of lesson subjects should be followed, modified only to meet the demands of a restricted school term or other local conditions.

## FALL TERM

### Lesson 1. JUDGING COTTON

*Problem.*—To learn how to judge cotton.

*Sources of information.*—College of agriculture or State publications; school texts in agriculture. Most State colleges issue bulletins in cotton judging. These should be used in connection with this lesson. Local score cards should also be obtained from the State college of agriculture.

*Illustrative material.*—Type cotton plants should be kept in the classroom for comparative purposes (fig. 1). Samples of various kinds and varieties of cotton may be obtained. Frequently comparisons must be made by the pupils between the cotton plants being judged and those used as standards.

*Topics for study.*—What are the principal points in judging cotton plants? What are the main objects of cotton judging? What is likely to cause depreciation in productiveness and quality?



A sample score card for cotton judging

The cotton plant	Score		
	Perfect	Pupil's	Corrected
Plant, vigorous, stocky, 25 points:			
Size, medium to large as influenced by soil, location, season, and variety	5	-----	
Form, symmetrical, spreading, conical; height and spread according to soil, etc.	5	-----	
Stalk, minimum amount of wood in proportion to fruit	5	-----	
Branches, springing from base, strong, vigorous, in pairs, short-jointed, inclined upward	5	-----	
Head, well branched and filled, fruited uniformly	5	-----	
Fruiting, 24 points:			
Bolls, large, abundant, uniformly developed, plump, sound, firm, well-rounded, apex obtuse, singly or in clusters	4	-----	
Number of bolls, according to variety, soil, and season	4	-----	
Bolls per plant, thin uplands, 10-20; fertile uplands, 20-25; bottoms, 50-100; special selection, 100-500	4	-----	
Bolls per pound of seed cotton, large, 40-60; medium, 60-75; small, 80-110	4	-----	
Character of bolls, number of locks 3 to 5; kind of sepals; retention of cotton	4	-----	
Opening of bolls, uniform including top crop, classify as good, medium, poor	4	-----	
Yield—Standard, 1 bale per acre, 30 points:			
Seed cotton, estimated by average plant, distance of planting, percentage of stand, plants per acre; thin uplands, 10,000; fertile uplands, 6,500; bottoms, 4,500; distance of plants, 3½ by 1¼ feet, 4½ by 1½ feet, 4½ by 2 feet, respectively	12	-----	
Percentage of lint, not less than 30, standard 33 to 35	12	-----	
Seeds, 30-50 per boll, large, plump, easily delinted; color, according to variety; germination not less than 85 per cent	6	-----	
Quality and character of lint, 21 points:			
Strength, tensile strain good, even throughout length	5	-----	
Length, common standards for upland, short ¾ to 1 inch, medium 1⅞ to 1½ inches; long staple, 1⅞ inches and better	5	-----	
Fineness, fibers soft, silky, and pliable, responsive to touch	5	-----	
Uniformity, all fibers of equal length, strength, fineness	5	-----	
Purity, color dead white; fiber free from stain, dirt, and trash	1	-----	

Number of plant \_\_\_\_\_ Source \_\_\_\_\_  
 Type \_\_\_\_\_  
 Remarks on plant \_\_\_\_\_  
 Date \_\_\_\_\_, 19\_\_\_\_ Name of pupil \_\_\_\_\_

(The above score card is offered only as a suggestion. It would be well to write to the State agricultural college and obtain the local card issued by that institution.)

What is meant by "trueness to type" in the cotton plant? Main points to be considered in all cotton production: (1) Do the plants yield well? (2) Do they mature early enough to escape severe insect damage? (3) Is the present crop an improvement over that of last year? (4) Is the lint produced of a high grade? The plants should be sturdy, of good color, well fruited, and of medium height. The bolls should be well formed, abundant, and of uniform time in opening. The yield should measure very closely to the standard for the variety used. The color, strength, and fineness of the lint should meet the requirements of grading as given in Lesson 4 (fig. 2).

*Practical exercises.*—Score cards similar to the one suggested may be made by the pupil on a sheet of paper if cards are not available. The first two subjects on the card must be judged in the field. Estimates should be made of the average yields per acre for the same variety of cotton on different farms or on different parts of the same farm. The pupil should use several cards in judging cotton from different fields.

*Project work.*—If the pupil has already raised an acre of cotton as his project, this cotton may be scored on his card. If no project cotton has been grown, lessons learned from judging other cotton should be retained for help in the home project of next year.

*Correlation.*—Language: Write an account of how to judge cotton. Tell why it is important to improve the yield of cotton.

Drawing: Make simple drawings of a well-formed cotton plant. Make drawings of a cotton boll, both before and after it has opened.

Arithmetic: Estimate the number of plants in the cotton acre that most nearly approach the standard type. What percentage of the entire number is this? What percentage of the plants rank as low producers? What would be the producing rank of the entire acre?

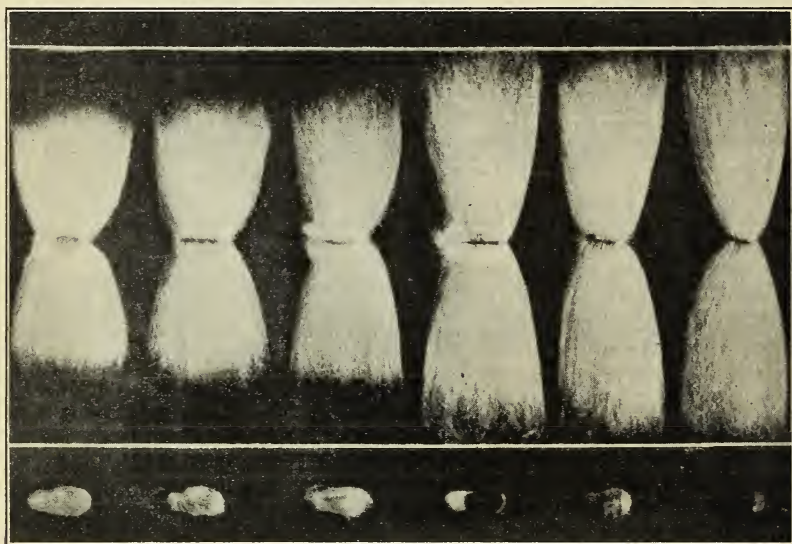


FIG. 2.—Fiber and seeds of American cottons

#### Lesson 2. SELECTING SEED

*Problem.*—To learn how cottonseed is selected.

*Sources of information.*—Farmers' Bulletins, 501, 1384; Department Bulletin 1219; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Samples of varieties of cotton that have proved profitable in the school area should be obtained for study. Exhibits of the different varieties may be collected and preserved at the school. Charts showing the characteristic growths of the best types of cotton may be exhibited for comparative study.

*Topics for study.*—Qualities that are to be desired in the cotton plant. Defects in boll structure to be looked for in selecting seed for planting. Lines of growth along which improvement should be made. How may the desired improvement be brought about? Why good seed is necessary for planting? What constitutes good seed for planting? Where may good seed be obtained in the home locality? How should seed be gathered for planting? Importance of special



ginning of seed to be saved for planting purposes. Why should the gin thus used be cleaned of traces of other seeds? Bad effects due to mixing seeds at gin. How cotton "runs out" through mixing seeds. Importance of separating seed by size and by weight. Methods used in this separation. Importance of uniform seed. How should selected seed be preserved until planting time? Bad effects of mixing seeds of different grades. Saving in costs by using pure seed.

*Practical exercises.*—Study the various methods farmers employ in selecting their seeds for next year's planting. Make a list of the most profitable varieties of cotton grown in the home neighborhood and study their structure, growth habits, and fruit-bearing abilities.

*Project work.*—Select enough seed to plant the cotton project acre next year. If the pupil has already conducted a cotton project the past year, this seed should be selected from that project. Seed should be selected from only the most productive plants, with the aim of fixing and improving desired strains.

*Correlation.*—Language: Write a full account of how the selected seed was obtained. Write an account of the different varieties of cotton grown in the school area, giving their characteristic good and bad points.

Drawing: Make charts showing relative yield values of the different varieties studied.

Arithmetic: Pick cotton from 50 plants of poor yield and from 50 plants of good yield. Weigh this cotton separately and determine how many plants of each kind per acre would be necessary to produce 1,500 pounds of seed cotton or one 500-pound bale of lint. Determine the average number of bolls per plant that each kind bears and estimate the number required to produce the 500-pound bale.

### Lesson 3. PICKING AND GINNING COTTON

*Problem.*—To learn how picking and ginning cotton is done.

*Sources of information.*—Farmers' Bulletin 764, Department Bulletin 288; college of agriculture or State publications; school texts in agriculture; catalogues of supply houses that furnish gin machinery.

*Illustrative material.*—Pictures of cotton picking, of gins, and of methods of ginning may be collected and kept at the school. Bags for picking cotton may be made by the sewing classes.

*Topics for study.*—Methods used in picking cotton. Advantages of cotton-picking machines. Types of machines in use. What kind of labor is generally employed when cotton is picked by hand (fig. 3)? What is this labor paid? Compare these wages with what was paid 10 years ago. What is a fair average day's picking? What is done with the cotton after it is picked? Danger of deterioration of product from improper storage. How is cotton taken to the gin? What is a gin for? How does it separate the lint from the seed? What are the brushes for? How do the saws work? Study carefully how cotton is baled. Use of bagging and ties. Why should these bales be protected from the weather? Use made of the cotton-seed by neighboring farmers. Ginning certificates. Methods of keeping ginning records. What is a compress used for? What is a compressed-bale locker like? How should cotton be baled for

export trade? Advantages and disadvantages of the round and of the square bales. Differences in ginning and baling the long and the short staple cottons. Prevailing cost of picking and ginning each kind.

*Practical exercises.*—Study the ginning of cotton at some local gin (fig. 4). Learn every step taken from the time the cotton leaves the wagon until it returns to the farmer baled and ready for the market.

*Project work.*—If the pupil has an acre of project cotton, he should either gin it himself with a small hand gin or have it done at some community gin. If there is no project cotton, the pupil



FIG. 3.—Picking cotton

should learn the ginning process, so that he can apply it to his project work next fall.

*Correlation.*—Language: Write a full account of how the home cotton crop was ginned.

Drawing: Make a simple drawing of the cotton gin, showing its parts and their office in ginning cotton.

Arithmetic: Estimate the cost of picking and ginning the project acre or an acre from the home cotton field. From this cost estimate the cost of harvesting and preparing for market the entire community cotton crop.

#### LESSON 4. GRADING COTTON

*Problem.*—To learn how to grade cotton.

*Sources of information.*—Department Bulletins, 121, 591, 644; college of agriculture or State publications; school texts in agriculture.



*Illustrative material.*—Samples of the various grades of cotton should be obtained and kept by the school for comparative study. The official grades of cotton may be obtained either from the Department of Agriculture, in Washington, D. C., or from the local college of agriculture.

*Topics for study.*—The importance of grading cotton. Names given the various grades of cotton. Characteristics of each grade. Principal factors that determine grades are (1) impurities or foreign matter in the cotton and (2) color of the fiber. What kind of cotton is “middling”? What grades are produced in the cotton fields about the home? Which grades bring the highest prices? Which bring the lowest prices? What terms are used to designate

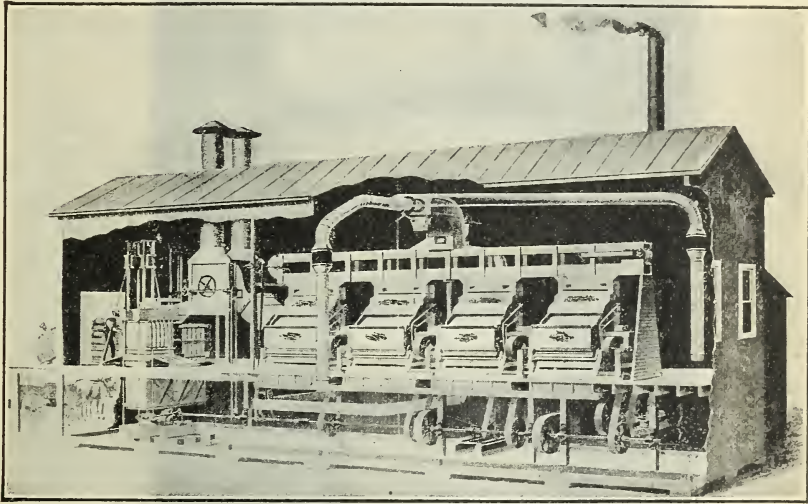


FIG. 4.—Cotton gin

cotton fibers that are not white? Impurities sometimes found in cotton: (1) Leaves; (2) dirt; (3) sand; (4) motes; (5) unripe fibers. How do these get into the cotton? Impurities that are caused by bad ginning: (1) Motes; (2) stringy cotton; (3) cut seeds. What should be the condition of the cotton when it is ginned? What weather conditions have an influence in determining the color of cotton? Obtaining samples for grading purposes. From what part of the bale and how much cotton should be taken for sampling purposes? Time cotton samples should lie before being classed. How grading should be done. Importance of repeatedly unfolding the sample. Why samples should not be mixed or allowed to remain together. Best time in the day for grading cotton. Importance of proper light when classing samples. How cotton standards should be protected. What are “working” standards? What are some of the grade characteristics of the different growths of cotton? Of what importance is the length of fiber in grading samples? Relative values of the different grades of cotton. Importance to the cotton farmer of daily newspaper reports on cotton prices. Why is it best

to keep early and late pickings separate? What three grades cover the bulk of cotton grown in an average season? Why is a uniform grading system important (fig. 5)?

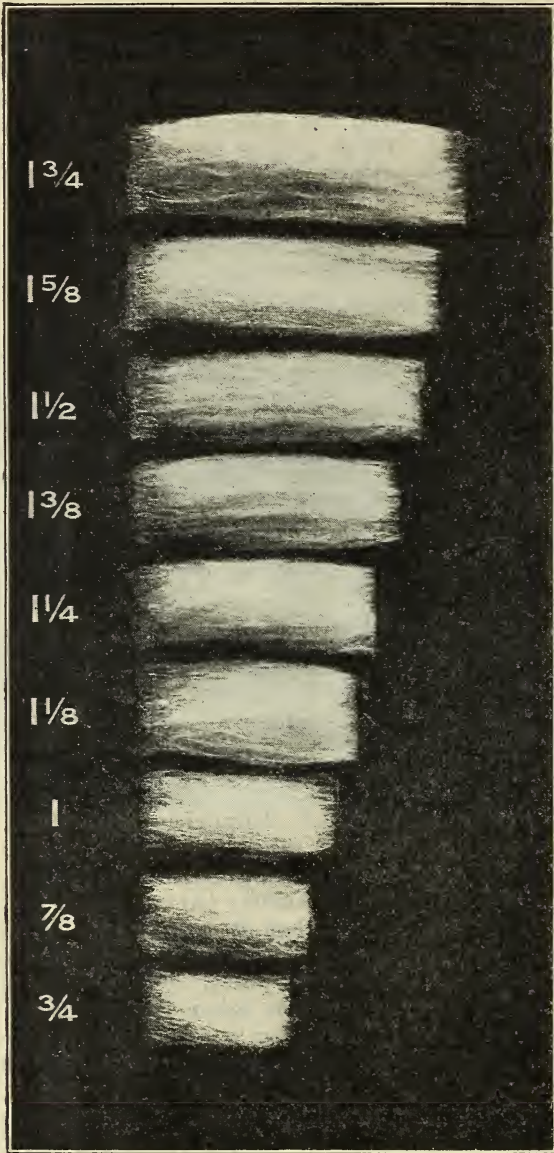


FIG. 5.—United States official cotton standards

*Practical exercises.*—The pupil should visit some market where cotton is being graded and follow the work step by step. After learning as much as possible there he should attempt to grade sam-



ples himself, first under direction of an experienced classer and then alone.

*Project work.*—If the pupil has a cotton project, he should carefully grade his cotton before it is placed on the market: if he has no such project, he should grade the home cotton before it is sent to town.

*Correlation.*—Language: Write a full account of how grading is done and the importance of the work.

Drawing: Make a chart showing the relative values of the different grades of cotton found about the home. From market quotations for these grades place on the chart opposite each grade its selling value. Note fluctuations in selling values.

Arithmetic: From the market quotations estimate the selling value of all the different grades of cotton raised in the school area.

#### Lesson 5. STORING AND MARKETING COTTON

*Problem.*—To learn how cotton is stored and marketed.

*Sources of information.*—Farmers' Bulletin 775; Department Bulletins, 216, 277, 375, 457; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Photographs of cotton warehouses and of common methods of storing cotton on home farms may be obtained and studied. Visits should be made to near-by warehouses to learn how cotton is properly stored. Daily papers giving market quotations for cotton can be used to advantage in studying fluctuations of price, etc.

*Topics for study.*—Common methods of storing baled cotton about the home. How cotton deteriorates if left exposed to the weather (fig. 6). How cotton may be protected while stored out of doors. Use of covers and flooring. Advantages derived from storing cotton in community warehouses. How cotton is entered in warehouse records. Proper functions of the cotton warehouse. What are the advantages in thus storing cotton? What is a standard warehouse? Of what use are warehouse receipts? Of what banking value are they? How long should cotton be stored? Why is it bad to dump a good deal of cotton on the market at one time? Study the local cotton market. What are "cotton factors"? Elements necessary in obtaining a good market for cotton: (1) Proper storage facilities; (2) standardized product; (3) reliable quotations. Types of cotton demanded by different buyers. Ultimate destinations of local cotton crop. Factors that cause marked fluctuations in prices quoted for local cotton. Types of cotton used for different kinds of manufactured products. Selling losses due to improper handling of product. Methods of selling the cottonseed. What relation is there between market prices and the quality of cotton? Of the seed? Why is it better to sell lint cotton than seed cotton? Relation of cotton buying to cotton growing: (1) Discrimination in buying; (2) deterioration in varieties; (3) development of long-staple cotton; (4) limitations in buying; (5) advantages of a field inspection.

*Practical exercises.*—A study may be made by the pupil of the different ways cotton is stored about the home. Comparisons should

be made and a proper way determined to store the home crop. Have pupils keep a record of cotton sales in the local market over a period of at least two weeks. Indicate on this record prices paid for different grades and for different varieties.

*Project work.*—Have pupil prepare proper storage for the project crop if he has one (fig. 7). The project cotton should be sold by the pupil alone, all details of the sale being attended to by him without outside help.

*Correlation.*—*Language:* Write an account of how the home cotton crop is stored. Describe a cotton warehouse and tell how its records are kept. Give an account of some local cotton market and its method of handling the local crop.



FIG. 6.—Deterioration of baled cotton due to exposure to the weather

*Geography:* On an outline map of the world, color the cotton areas blue. Place a red mark on the great cotton markets and cotton manufacturing centers.

*Drawing:* Make a diagram of the local cotton warehouse showing all facilities for storing and protecting the product.

*Arithmetic:* Estimate the loss to the local cotton crop from improper storage. From quotations as given in the daily paper, estimate the value of the home crop, of the community crop, and of the crop stored in some local warehouse. If the price of cotton falls  $1\frac{1}{2}$  cents per pound during the week, what will be the percentage of loss in the home crop? In the community crop? What the actual loss in dollars and cents?



## Lesson 6. PRINCIPAL USES OF COTTON

*Problem.*—To learn the principal uses of cotton.

*Sources of information.*—College of agriculture or State publications; school texts in agriculture; bulletins or leaflets from local cotton mills and supply houses.

*Illustrative material.*—Samples of the various products into which cotton is manufactured should be collected and exhibited for study.

*Topics for study.*—What are the local uses of cotton? How many of the home industries are based upon the use of some form of cotton? History of the development of cotton manufacturing. How cotton thread is made. How cotton cloth is woven. Different kinds of cloth made from cotton. The old home spinning wheel. The modern machines used for spinning. Areas in the United States

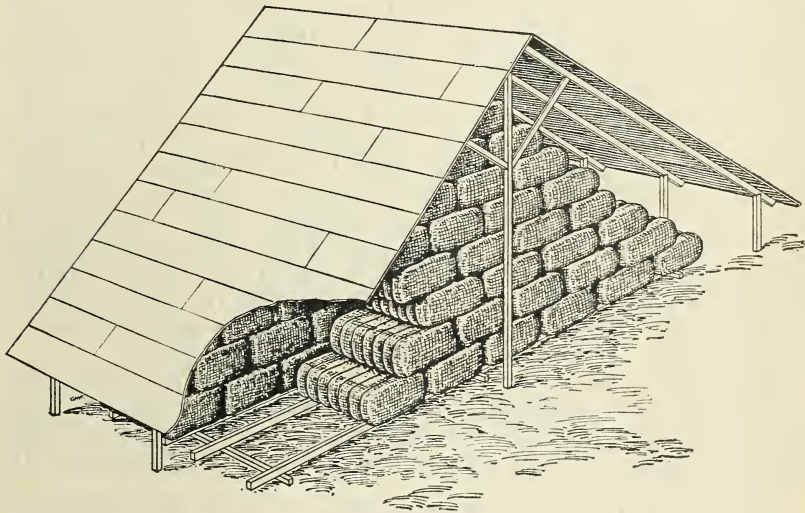


FIG. 7.—Shed for emergency storage of cotton

where cotton manufacturing has developed rapidly within recent years. Methods of transporting raw cotton to the manufacturing centers. The dyeing of cotton. Cotton art fabrics and how they are made. Use of cotton in rug weaving. Paper made from cotton rags and waste. Advantages of cotton fibers over other vegetable fibers: (1) Ready absorption of dyes; (2) ease in spinning; (3) strength of thread. Use of cotton in mattress making. Other uses of cotton as found about the home.

*Practical exercises.*—List the various uses of cotton. Check off those uses that are found about the home. Visit local cotton mills and compare methods found in practice there with those used by our ancestors. Plan new uses for cotton products about the home.

*Correlation.*—Language: Write a full account of a visit to some local cotton-manufacturing plant. Write an account of the various uses to which cotton is put in the home.

*Drawing:* Make a simple plan of some spinning or weaving room visited in the local mill.

## WINTER TERM

## Lesson 7. THE BY-PRODUCTS OF COTTON

*Problem.*—To learn the by-products of cotton.

*Sources of information.*—Farmers' Bulletin 1179; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Samples of the various by-products of cotton should be kept at the school. These may be obtained from local oil mills and supply houses. Pictures showing the different methods of manufacturing these by-products should be displayed for class study. Exhibits may be made of the agricultural and the manufactured by-products of cotton.

*Topics for study.*—What are the principal by-products of cotton? From which parts of the plant do these come? Products that can be made from the lint, from the seed, from the stalks. By-products of the plant that are used by the farmers about the home. Feeding value of cotton and its product. Products derived from cotton that are used in home cooking. What can cotton hulls be used for? What are linters? From what part of the plant does the cake come? How is this made? Methods for manufacturing crude oil from the seeds. Products that come from the oil: (1) Cottolene; (2) soap; (3) salad oil; (4) stearin. Products that come from the hulls: (1) Bran; (2) paper; (3) fertilizers. For what is the cottonseed meal used? What is the feeding composition of the various by-products? How much of these by-products will a ton of seed yield? Importance of the cottonseed oil industry. Proportion of local crops used by these mills. Kinds and quantities of cotton by-products used on the home farm. Use of seeds for directly fertilizing soil.

*Practical exercises.*—Make a survey of the uses of cotton by-products by the home community. Study home recipes that use some form of these by-products for cooking. Study formulas of fertilizers containing cotton products that are used by farmers in the school area.

*Correlation.*—Language: Write a full report on the survey suggested in practical exercises.

Drawing: Make charts showing fertilizer formulas that use cotton products. List all the by-products of cotton and indicate where they may be obtained.

Geography: Make a map of the home county showing where farms are located that raise cotton and where mills are situated that manufacture cotton by-products.

Arithmetic: From results obtained from the community survey estimate the value of the cotton by-products produced. Compare this with the total estimated value of the community cotton crop.

## Lesson 8. FEEDING VALUE OF COTTON PRODUCTS

*Problem.*—To learn the feeding value of cotton products.

*Sources of information.*—Farmers' Bulletins, 346, 1179; Department Bulletin 929; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Charts showing the feed values of different cotton products should be made and exhibited in the classroom.



Tables giving the necessary food elements for different farm animals should be made. Pictures showing the methods of preparing and feeding these cotton products may be obtained from concerns manufacturing them.

*Topics for study.*—Different feeding products made from cotton. Method of manufacture of each. Food elements found in each. What food elements do cows need? Horses? Other farm animals? How may these elements be supplied? Composition of feeding stuffs: (1) Water; (2) ash; (3) fat; (4) carbohydrates; (5) protein. What is meant by the digestibility of feeds? Uses of food nutrients: (1) Building body tissues; (2) supplying heat; (3) sources of energy. What unit is generally used for fuel value? Variations of food requirements of different kinds of animals. Variations due to kind of work. Composition of cottonseed products used for animal food. What quantities of protein, carbohydrates, and fats are found in each? What are the common grades and classes of cottonseed products? What are the feeding differences in cottonseed cake and cottonseed meal? How may cattle be fattened on cotton products? Use of these products with stock and with breeding cattle. Dangers in the use of cotton products when feeding them to some of the farm animals. Suggested rations containing cotton products for various animals. Comparison of cottonseed meal with other concentrates. The use of cotton products for feeding horses. Why should cottonseed meal be fed very sparingly to horses? Value of supplementing pasturage with cottonseed meal for some animals. Length of time meal should be fed. What is the cost of supplying the home animals with cottonseed meal in proper quantities? How does this compare with the cost of other concentrates that might be used?

*Practical exercises.*—Make a complete survey of how and what the neighborhood farmers feed their stock. Study the feeds that contain cotton products and tabulate the result of such feeding in regard to food value and financial costs. For the home animals, plan good feeding rations that shall contain the cotton products of the farm.

*Project work.*—Plan to use such parts of the project cotton as may be suitable for feeding purposes.

*Correlation.*—Language: Write a full report on the survey made as directed in practical exercises.

Drawing: Make charts showing costs and feeding values derived from this survey.

Arithmetic: Estimate exactly the cost of the cotton products used as feed through the winter months on the home farm. On a neighbor's farm. Compare these.

#### Lesson 9. HISTORY OF THE COTTON PLANT

*Problem.*—To learn the history of the cotton plant.

*Sources of information.*—College of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Pictures showing cotton fields in various countries may be used for illustrative purposes. Charts giving cotton production, past and present, for the leading cotton-producing areas of the world should be studied. World maps showing the great cotton areas of the world should be displayed in the classroom.

*Topics for study.*—Climatic conditions under which cotton grows naturally. Its adaptation to semitropic and mild temperate conditions. First historic appearance of the plant. Records found in Bible history. How the fiber was used by the early Egyptians, Greeks, and Phoenicians. Methods used for spinning and weaving the fiber in the olden times. How did the knowledge of cotton spread over the world? What Far-Eastern countries developed its use extensively? How did Spain become noted as a cotton-manufacturing country during the Middle Ages? What is the early history of cotton in America? Cotton areas of the new world. Reasons for thinking that cotton was not native to the United States. Introduction of cotton from Europe. Which of the early settlers developed this crop? What form of social life grew out of the cotton plantations? Spread of cotton culture south of Virginia. Importance of the cotton gin. Who invented the gin? Where was he living? What invention of the Englishman, Richard Arkwright, had an important influence on cotton development and manufacture? Increase in cotton production due to the gin since 1793. Development of cotton-manufacturing interests in this country. Why are so many cotton mills located along the fall line in the East? Why does the price of cotton fluctuate so much? What is the tendency in future cotton production in this country?

*Practical exercises.*—Make a survey of the history of cotton in the home neighborhood. Learn when cotton was first grown, where it was first planted, and the various advances that have been made in its cultivation. Report upon the development of cotton marketing in the community.

*Correlation.*—Language: Write a brief account of the history of the cotton plant. Write a comprehensive report of the survey made under practical exercises.

Drawing: On an outline map of the world, color the native homes of the cotton plant in blue. Color red the present productive areas.

#### Lesson 10. BOTANY OF THE COTTON PLANT

*Problem.*—To learn the botany of the cotton plant.

*Sources of information.*—College of agriculture or State publications; school texts in botany and agriculture.

*Illustrative material.*—Pictures and samples of cotton plants, cotton flowers, and fruiting bolls should be kept in the classroom for study. Individual plants with all their parts should be given pupils for study (fig. 8).

*Topics for study.*—Kind of root the cotton plant develops. Compare root system with that of corn. Position of secondary or branching roots. Is deep cultivation advisable after the plant has fully developed its root system? Why? Interior structure of the root. Where are the root hairs? What is their work? What do roots do for a plant? System of branching. How does this system vary with the different varieties of cotton? What is the function of the branch? What kind of structure do cotton branches have? Where are the vegetative branches located? Where do the leaves grow? Shape, structure, color, and function of the cotton leaves. Number of lobes to the leaves. Situation in relation to each other. How the



veins are arranged. Where are the flowers borne? Kind of flower the cotton plant has (fig. 9). Size, shape, and color of the corolla. Changes in color of the flower. Number of petals in the flower. Shape and arrangement of these. Where are the stamens and pistils located? How many are there of each? What are their functions? Location of the boll in relation to the flower. Size, shape, and color of the boll. Number of parts in each boll. How these are formed. Where are the seeds found? How many seeds are there in each compartment? Where does the lint grow? Characteristics of the lint from different kinds and varieties of cotton. Color, size, and structure of the cottonseed. Effects of cross-fertilization upon cottonseed. Conditions under which cottonseed will grow best.

*Practical exercises.*—Tabulate the most marked botanic characteristics of the different varieties of cotton grown about the home.

*Correlation.*—Language: Write a full account of the botany of the cotton plant.

#### Lesson 11. COMMON VARIETIES OF COTTON

*Problem.*—To learn the common varieties of cotton.

*Sources of information.*—Department Bulletin 644; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Samples of the varieties of cotton commonly grown in the home neighborhood should be kept at the school for comparative study.

Pictures of different varieties may generally be obtained by loan from the local college of agriculture.

*Topics for study.*—Which varieties of cotton are commonly grown about the home? Which of these varieties have proved the most profitable? Cotton groups: (1) Big-boll; (2) long-staple; (3) small-bolled early. Differences between Sea Island and Upland cotton. Types grown at home. Characteristic growth of each. Characteristics of Mexican Big Boll, Cook Improved, Council Toole, Big-Boll Triumph, Lone Star, Cleveland, Express, and any others common in the school neighborhood. History of the development of local varieties. Place each variety studied in its proper group as indicated above. Points to be looked for with each variety: (1) Sturdiness of plant; (2) resistance to disease; (3) manner and



FIG. 8.—A flowering cotton plant

quantity of fruiting; (4) time of fruitage; (5) ease in picking; (6) quantity of lint obtained; (7) size and color of seeds. Compare foreign types of cotton with those produced in this country. Which type of native cotton do the foreign most nearly approach? Are



FIG. 9.—Good types of cotton flower and boll

growing conditions very different for the foreign products? Why are not these cottons grown about the home?

*Practical exercises.*—Pictures of the different local varieties of cotton should be brought to the school for comparative study. Make a survey of local cotton varieties, giving full information on the points suggested above.



*Correlation.*—Language: Write a full account of the survey made under practical exercises. Write an account of the different varieties of cotton grown about the school.

Drawing: Make a chart showing the yields from the different varieties grown about the home.

Geography: On an outline map of the world, indicate the areas that produce American, Indian, and Egyptian cotton; use a different color for each area.

Arithmetic: How many plants of each of the different varieties studied would be necessary to yield three-fourths of a bale to the acre? (Allow an average of 10 bolls per plant.)

#### Lesson 12. PLACE OF COTTON IN ROTATIONS

*Problem.*—To learn the place of cotton in rotations.

*Sources of information.*—College of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Charts showing various cotton rotations in use on farms about the school should be displayed for class study. Diagrams showing how local farms are using rotations may be made.

*Topics for study.*—What rotation is. Some of the needs and advantages of local rotations. How rotation plans should be made. Uses of rotation: (1) To increase soil fertility; (2) to decrease disease and insect troubles; (3) to keep land continually at work; (4) to conserve farm labor. Requirements of different crops on the soil. How do different root systems tend to deplete soil fertility? What effect does culture of soil have on its fertility? Order of crops in rotation. Usual crops rotated: (1) Cash crop; (2) soil fertility crop; (3) feed crop; (4) cover crop. What crops are used for these purposes about the home? Why is it bad to plant the same crop continuously in a field? Of what advantage are legumes in a rotation? Effects of types of farm soils on kinds of rotations used. Improvements in yield and in soil fertility due to local rotations. Value of cowpeas or soybeans in any rotation. What winter crops should enter the community rotations? Why is it well to use a winter crop? What is its effect on soil washing? Compare yields from at least three widely separated local farms that use good cotton rotations.

*Practical exercises.*—Make a study of the best local rotation systems that are used by local cotton farmers. Plan improved rotations for the home crop.

*Project work.*—Plan a three-year rotation for the project cotton acre. Follow out this plan in all field work.

*Correlation.*—Language: Write an account of rotation as a necessary step in cotton farming and discuss the best cotton rotations observed about the neighborhood.

Drawing: Make detailed drawings of proper rotation systems for the home farm. Indicate the various fields and the sequence of the crops to be used in each field. Make charts showing acceptable rotations in which cotton is a factor.

Arithmetic: Estimate the size of each field as made in the above diagram and the quantity of seed necessary for each planting.

## Lesson 13. COMMUNITY COTTON PRODUCTION

*Problem.*—To learn how a community may produce cotton profitably.

*Sources of information.*—Farmers' Bulletin 1384; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Charts showing agencies available to aid in community cotton production may be made and exhibited in the classroom. Surveys of various neighboring local communities should be made, and studies to learn what cooperative efforts are being made should be undertaken.

*Topics for study.*—Why community cooperation in cotton production is needed. What the basis is of community cotton production. Advantages in a community growing only one variety of cotton. How this increases planting and cultural interests. Why especially needed in weevil-infested areas. How to organize for community production. What educational propaganda to encourage. How to get farmers to agree to a one-variety production. Necessity of holding to this variety after it has become established. How to select the variety. How to test varieties for local use. Why well-managed community gins are important. Problems in ginning that affect community production. What care to take of ginned seeds. How to develop community seed supplies. How to develop a good strain of pure seed. Four principal requirements for successful community cotton production.

*Practical exercises.*—Make a study of the home-community needs in cotton production and suggest a means for closer and better cooperation in the production of this crop.

*Correlation.*—Language: Write a full account of how the home community may be benefited by the introduction of cooperative cotton growing.

Botany: Study the different varieties of cotton with a view toward selecting the variety which will prove most adaptable to local conditions.

## SPRING TERM

## Lesson 14. PREPARATION OF THE SEED BED

*Problem.*—To learn how to prepare the seed bed.

*Sources of information.*—Farmers' Bulletin 364; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Pictures of fields in various stages of preparation before planting may be gathered and studied. Photographs of the different implements used in preparing the seed bed should be obtained. Actual plowing implements should be studied whenever possible.

*Topics for study.*—Location of the field to be planted. General slope of field. Does it receive the requisite amount of sunlight? Is there sufficient drainage? How should the field be drained if it proves to be too wet? Advantages of subsoiling. How may this be done when necessary? What kinds of tillage have been practiced previous to plowing? What crops does cotton frequently follow? In what condition have these crops left the seed bed? Use of a stalk

cutter to remove previous crops from the seed bed. Advantages of pulverizing surface soils before breaking. Proper time for breaking land. Is cotton land plowed in the fall or in the spring on the farms about the home? What are the advantages and disadvantages of each of these methods of plowing? Is land generally plowed in the fall when a grain crop precedes cotton? Conditions that govern time of plowing are (1) previous crop and (2) type of soil. Effect of winter rains upon fall planting. Depth to which cotton land should be plowed. Types of plows in use for preparing seed bed. Kinds of disks and harrows used on the fields. Advantages of each kind. Need for disking and harrowing the land. When should this be done? Is fertilizer generally applied when the seed bed is made or when the seed is planted? How are check-row markers used? How is the land finally bedded? How are the furrows opened with a middle burster or lister? If fertilizers are distributed when the beds are open, what kind of an implement is used? What differences are there in preparing the seed beds for short-staple cotton and for Sea Island cotton?

*Practical exercises.*—Study the various methods neighboring farmers use in preparing their seed beds for cotton. Learn the use of each implement needed in preparing land for cotton planting.

*Project work.*—Prepare the cotton-project seed bed in the best manner possible. This bed should be at least an acre in extent. Keep an exact record of all costs incident to this work.

*Correlation.*—Language: Write a full account of how land is prepared for planting cotton and especially how the project acre was prepared.

Drawing: Make a diagram of the project acre showing the location of the rows and the distances apart the seed is to be planted.

Arithmetic: Estimate the total cost of preparing the project acre. Itemize each charge. Estimate the cost of the same work on the home farm fields.

#### Lesson 15. COTTON FERTILIZERS

*Problem.*—To learn what cotton fertilizers to use.

*Sources of information.*—College of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Charts showing the constituents of various fertilizers suitable for cotton should be displayed in the classroom. Samples of fertilizer ingredients may be obtained from commercial houses. Tables giving local fertilizers in use should be made.

*Topics for study.*—Differences between manure and commercial fertilizers. Advantages and disadvantages of each for use in enriching cotton soils. What elements are needed in cotton manures? Where can manure be obtained in sufficient quantity for cotton fields? Use of cottonseed directly in the soil. Draft of cotton on soil fertility. What elements are the more rapidly depleted by this crop? What fertilizer elements do local cotton soils need? What effect does commercial fertilizer have on the soil? What are some of the more popular commercial fertilizers that are used for cotton? What is a complete fertilizer? What is guano? What is meant by a 10:2:2 fertilizer? Advantages derived from the home mixing of cotton fertilizers. How these should be mixed. Different formulas for



home mixing. Quantity of fertilizer that should be used per acre. Values of cottonseed and cottonseed meal as fertilizers. What forms of nitrogen are used to fertilize cotton? What does a phosphate fertilizer do for cotton? A potash fertilizer? Why do cotton soils need so much nitrogen? Cost of each type of fertilizer. Times when it is economy to use each type. What lime does for the cotton plant. The value of composts. Effects of fertilizers on the maturity of cotton. When fertilizers should be applied. What is the local custom in this respect? How do local farmers apply the fertilizer they use? Value of legumes in the fertilization of cotton. Kinds of legumes that should be planted. Time and amount of planting. How should the legume crop be handled? What relation is there between successful cotton production and the use of commercial fertilizers? What steps are necessary to build up the soil permanently on a run-down cotton farm? What efforts are being made in the home neighborhood to permanently improve the cotton soils?

*Practical exercises.*—Make a complete survey of the manner in which local farmers increase the fertility of their cotton soils. Prepare formulas of the various kinds of fertilizers in local use. Prepare suitable fertilizing formulas for the home fields.

*Project work.*—Fertilize the cotton-project acre in a suitable manner.

*Correlation.*—Language: Write a complete report on the survey made under practical exercises. Tell how you fertilize the cotton-project acre.

Drawing: Make charts showing elements, and quantities of each, forming the cotton fertilizers commonly used in the school district. Prepare tables showing how the cotton-project fertilizers were made. Arithmetic: Estimate the cost of preparing each of these fertilizers at home. Compare this with local market prices. If nitrogen is worth 18 cents per pound and phosphoric acid and potash 6 cents each, what would be the cost of a 10:2:2 fertilizer for the project acre? Of a 10:3:3? Of a 5:4:5?

#### Lesson 16. PLANTING COTTON

*Problem.*—To learn how to plant cotton.

*Sources of information.*—Farmers' Bulletin 501; Department Bulletin 668; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Pictures of fields ready for planting cotton should be displayed and studied. Photographs of various implements used in planting cotton may be obtained from supply houses (fig. 10). Whenever possible visits should be made to near-by farms for the purpose of studying how planters work and how the farmers plant their fields.

*Topics for study.*—Proper conditions of the cotton field just previous to planting. Time when planting starts locally. Effect of type of soil to be used at this time. Which will be planted first, clay or sand soils? Why? Why is it best to plant cotton as soon after frost as possible? Relation of the presence of weevils to the time of planting. Is there any difference in the time of planting between the Sea Island and the Upland types of cotton? Proper



spacing of plants. Quantity of seed necessary per acre. Advantages and disadvantages of flat and bed planting. Which system is practiced about the home? How are the cotton furrows broken open? How and when is the fertilizer distributed? How is cottonseed sometimes dropped by hand? Types of cotton planters in local use. Advantages and disadvantages of each. Why is cotton generally planted in drills? Proper distances between rows. How the hand planter works. How the horse planter works. Fertilizer-distributing attachments and how they work. Sowing practices in arid regions. What effect on growth does crowding have? When has the plant grown sufficiently to make a stand?

*Practical exercises.*—Learn the best ways that local farmers have of planting their cotton. Plan improvements in cotton-planting methods for the home.

*Project work.*—Plant the cotton-project acre according to the best methods studied. Keep a careful record of all labor and expenses.

*Correlation.*—Language: Write a short account of how cotton should be planted. Write an account of how cotton is planted by the farmers about the home.

Drawing: Make a simple drawing for a homemade cotton planter.

Manual training: Construct a cotton planter from this drawing.

Arithmetic: Estimate the cost of fertilizer, seed, and labor for planting the project cotton, the home cotton crop. Compare this with what it cost neighboring farmers to plant their crop.



FIG. 10.—A cotton planter

#### Lesson 17. CULTIVATING COTTON

*Problem.*—To learn how to cultivate cotton.

*Sources of information.*—Department Bulletin 526; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Photographs or samples of various implements for cultivating cotton should be kept at the school. Pictures of cultivated cotton fields may be gathered for study.

*Topics for study.*—Number of cultivations generally needed. Objects of cultivation: (1) To destroy weeds; (2) to make a mulch for retaining moisture; (3) to warm the soil; (4) to make plant food more available. Implements used for first cultivation (fig. 11). What is meant by "barring off" cotton? Use of a turn plow. Advantages over a scrape. Hoeing the cotton. Why is chopping out the cotton necessary? When is this done? What kind of labor

is used about the home for chopping cotton? Relation between chopping and the branching habits of the cotton plant. How many plants are left in each hill? When does the second cultivation take place? What implements are generally used for this cultivation? Why is this called "siding" cotton? Objects of siding: (1) To support the plant with more earth; (2) to form a mulch about the plant; (3) to kill weeds. Use of a wide scrape or sweep for this work. Cultivating both sides of the row. Third cultivation. Importance of clean middles. Use of a double cultivator for this work. When does the third cultivation take place? What depth should be reached in each cultivation? Why should later cultivation be more shallow than the first? How deep



FIG. 11.—Cultivating cotton

should the mulches be? Importance of pulverizing all surface clods. How often may siding be repeated? What are the practices on the farms about the home? When are late hoeings necessary? Expense of hand hoeing compared with horse cultivation. Advantages and disadvantages of each method. Frequency of late tillage—four plowings a minimum and six a maximum. How late is tillage continued in the home area? Relation of tillage to the branching habits of the plant. Middles always thrown out in last tillage. "Laying-by" the cotton crop. When does this take place?

*Practical exercises.*—Make a complete survey of manner in which farmers cultivate their cotton in the home community. Plan the best possible cultivating schedule for the home crop from this survey.



*Project work.*—Carefully cultivate the project cotton according to the most approved plans.

*Correlation.*—Language: Write a full report on the survey made under practical exercises. Write an account of the manner in which the project cotton was cultivated.

Arithmetic: Estimate the total cost of cultivating the project cotton and the home cotton. Compare these costs with that of some good cotton farmer.

#### Lesson 18. COTTON DISEASES

*Problem.*—To learn the common cotton diseases and their control.

*Sources of information.*—Farmers' Bulletins, 555, 1187; college of agriculture or State publications; school texts in agriculture.

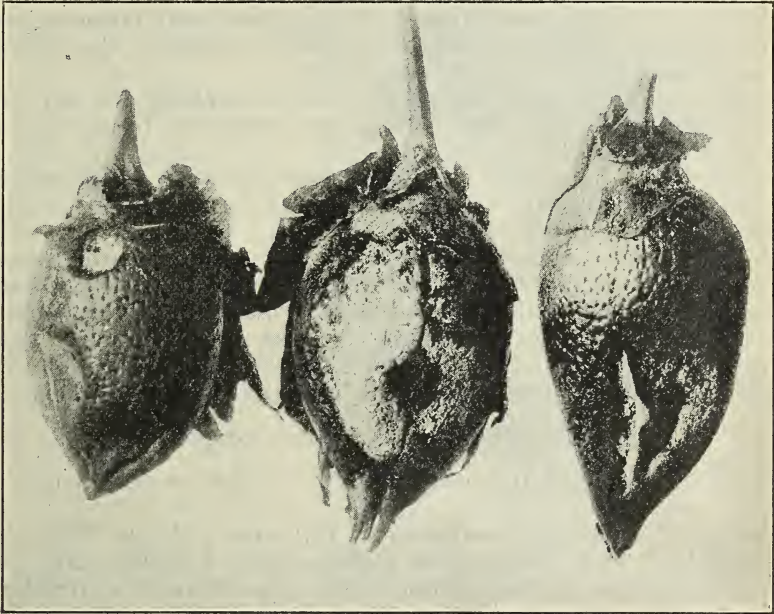


FIG. 12.—Anthracnose on cotton bolls

*Illustrative material.*—Samples of cotton suffering from diseases common in the home neighborhood may be collected and preserved for class study. Pictures of cotton diseases should be displayed in the classroom. Charts showing various remedies for these diseases should be used.

*Topics for study.*—Cotton diseases that are common in the school area. Means used to eradicate these diseases. What is meant by resistant varieties? How may these be produced? Importance of rotation of crops in combating cotton diseases. Importance of diseases of cotton. Principal cotton diseases: (1) Wilt; (2) rootknot; (3) anthracnose (fig. 12); (4) bacterial blight; (5) shedding of bolls; (6) rust; (7) Texas root-rot. What is the general cause of wilt? How do cotton plants look that are attacked by the wilt? What



remedies may be used to combat the wilt? How may resistant varieties be obtained? Characteristics of root-knot. Importance of rotation in controlling this disease. What other crops than cotton are attacked by root-knot? Loss due to this disease. Cause of root-knot. How it may be controlled locally. Presence of anthracnose in the cotton field. Characteristics of this disease. Damage done. How is it controlled? Does local cotton suffer from anthracnose? What remedies do local farmers use for the trouble? How may bacterial blight of cotton be recognized? How is blight controlled? Nature and occurrence of boll shedding. Cause and control of this shedding. Prevalence of rust in cotton. Type of soils where rust is most common. How to recognize rust. Cause and control of cotton rust. Minor diseases of the cotton plant. Why is clean cultivation always necessary?

*Practical exercises.*—Visit various cotton farms and inspect them carefully for evidences of disease. Learn how each farmer treats cotton diseases as they appear in his fields. Tabulate the various diseases found and the remedies employed.

*Project work.*—Inspect the project cotton carefully for any diseases. Take such precautions as may seem necessary to prevent the spread of any trouble found.

*Correlation.*—Language: Write an account of what was found on the inspection trip to the neighboring cotton farms. Tell what was done to protect the project cotton.

*Drawing:* Make simple drawings of the diseased cotton plants found in the inspection trip. Make charts showing the disease found, damage done, causes, and remedies used to overcome the troubles.

*Arithmetic:* Estimate the community losses in cotton due to these prevalent diseases. Do the same thing for the home and the project crops. Estimate the total costs of the remedial measures taken.

#### LESSON 19. INSECTS THAT ATTACK COTTON

*Problem.*—To learn the insects that attack cotton and their control.

*Sources of information.*—Farmers' Bulletins, 501, 606, 733, 831, 872, 890, 1319, 1329; Department Bulletins, 233, 723, 926, 1204; college of agriculture or State publications; school texts in agriculture.

*Illustrative material.*—Collections of different insects that attack cotton should be made and studied. For aid in this work consult Farmers' Bulletin 606. Pictures showing life history of these pests may be displayed in the classroom. Charts showing damage done by the cotton insects, spraying and dusting formulas, and means of control should be made. Dusting machines may be obtained from supply houses for study. Visits should be made to near-by cotton fields to learn the various ways insects are killed.

*Topics for study.*—What insects attack the local cotton crops? How much damage do these do? A typical insect. Its life history. How biting insects may be killed. How sucking insects may be killed. Why is clean cultivation always advocated to destroy insect pests? Parts of the cotton plant attacked by insects. How the boll weevil attacks the squares and blooms. Insects that attack the bolls: (1) Bollworm; (2) cotton-boll weevil (fig. 13). Insects that attack

the leaves: (1) Cotton caterpillar; (2) red spider; (3) certain kinds of plant lice; (4) grasshoppers; (5) other kinds of caterpillars. Insects that attack the roots and stems: (1) Cutworms; (2) corn-root aphid. Insects that attack the buds: (1) Cowpea-pod weevils; (2) boll weevil; (3) grass worm; (4) cotton-boll cutworms. What nematodes do to cotton. Life history of the cotton bollworm. Damage done by this insect. How it can be controlled. Life history of the cotton-boll weevil. Why this insect is so hard to kill. How does this boll weevil eat? What happens to the bolls after attack by the weevil (fig. 14)? What damage is done by this pest locally? Where does the weevil spend the winter? What preventive measures are taken locally? What is the value of an early-maturing crop of cotton?

Spread of the cotton-boll weevil. Effect of this insect on both short and long staple production. Spraying or dusting cotton as a preventive measure. At what stage of growth does the cotton caterpillar damage the plant? What is the life history of this pest? How are cotton plants dusted to prevent caterpillar damage? What is "red rust" on cotton? What kind of weather is most favorable for the red spider to work? How may it be controlled? Life history of the cutworms. Amount of damage done and usual treatment given the cotton. Similarity between the cowpea-pod weevil and the boll weevil. Danger of mistaking these weevils. Comparative damage done

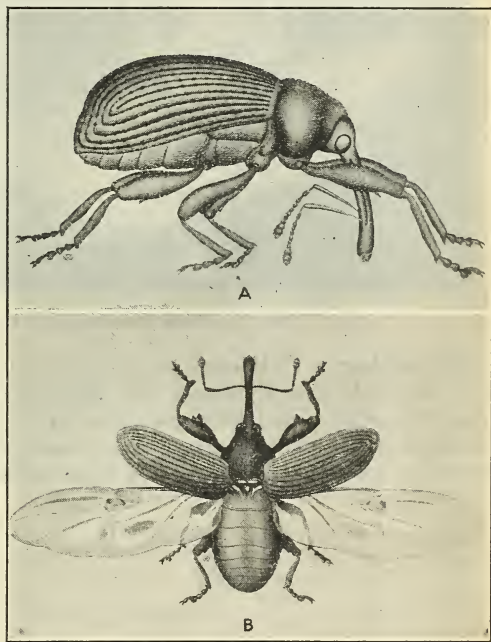


FIG. 13.—Drawing of adult boll weevil much enlarged

by each. What spraying formulas are used to fight cotton insects on the neighboring farms? What resistant varieties of cotton are planted? Is clean cultivation generally common on these farms? How may early buds and bolls be protected? Different kinds of earliness in cotton. Effect of different kinds of cultivation on the quality of the cotton fiber. Importance of proper rotations in controlling insect pests. Effect of weevil injuries on the quality and market price of cotton fibers. Preserving resistant and superior qualities. The economic aspect of cotton-insect ravages.

*Practical exercises.*—Make a complete survey of the damage done by insects to local cotton crops and the remedial measures used. Inspect the home crop carefully for the presence of destroying insects, and take such measures as are necessary to remove the pests,

*Project work.*—Inspect the project crop for insects. Use every means to prevent damage to the fiber.

*Correlation.*—*Language:* Write a full report of the survey made under practical exercises. Make a report upon the condition of the project cotton.

*Drawing:* Make drawings of the various insects found attacking the cotton about the home. Make detailed drawings of the life history of these insects. Make spraying charts for the project cotton.

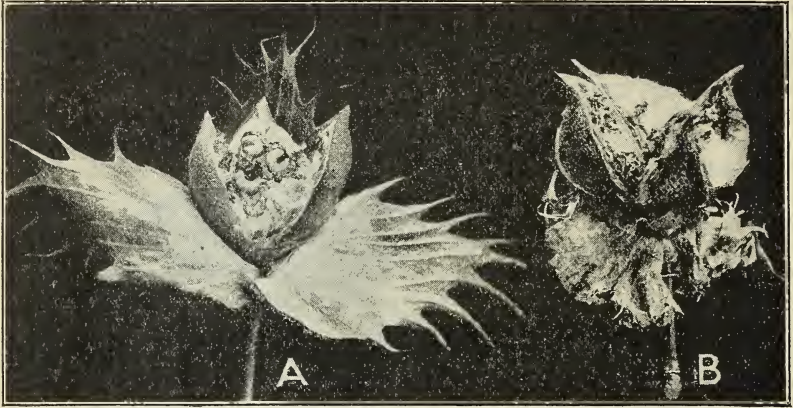


FIG. 14.—Bolls infested with boll-weevil larvæ

*Entomology:* Collect and mount (see Farmers' Bulletin 606) specimens of each kind of insect that attacks the home cotton.

*Arithmetic:* Carefully estimate the loss to the community, the home, and the project crops from insect depredations. Estimate the cost of all preventive measures used on these crops.



## BULLETINS USED AS REFERENCE IN THESE LESSONS

### FARMERS' BULLETINS

- 346. Computation of Rations for Farm Animals by Use of Energy Values. Price, 5 cents.
- 501. Cotton Improvement Under Weevil Conditions. Free.
- 555. Cotton Anthracnose and How to Control It. Price, 5 cents.
- 606. Collection of Insects for Study. Free.
- 733. The Corn and Cotton Wireworm. Price, 5 cents.
- 764. Cotton Ginning Information for Farmers. Price, 5 cents.
- 775. Losses from Selling Cotton in the Seed. Free.
- 831. The Red Spider on Cotton. Free.
- 872. The Bollworm or Corn-Ear Worm. Price, 5 cents.
- 890. How Insects Affect the Cotton Plant. Free.
- 1179. Feeding Cottonseed Products to Livestock. Free.
- 1187. Cotton Diseases. Free.
- 1319. Cotton Dusting Machinery. Free.
- 1329. The Boll-Weevil Problem. Free.
- 1384. Community Cotton Production. Free.

### DEPARTMENT BULLETINS

- 121. Spinning Tests of Upland Long-Staple Cotton. Price, 5 cents.
- 216. Cotton Warehouses. Price, 5 cents.
- 233. Relation of the Arizona Wild Cotton Weevil to Cotton Planting in the Arid West. Price, 5 cents.
- 277. Cotton Warehouse Construction. Price, 10 cents.
- 288. Custom Ginning as a Factor in Cottonseed Deterioration. Price, 5 cents.
- 375. Disadvantages of Selling Cotton in the Seed. Price, 5 cents.
- 457. Relation Between Primary Market Prices and Qualities of Cotton. Price, 5 cents.
- 526. Experiments in Single Stalk Culture. Price, 5 cents.
- 591. Manufacturing Tests. Price, 5 cents.
- 644. Lint Percentage and Lint Index of Cotton. Price, 5 cents.
- 668. Nurse Planting Select Cottonseed. Price, 5 cents.
- 723. The Pink Bollworm. Price, 5 cents.
- 926. Studies in the Biology of the Mexican Cotton-Boll Weevil. Price, 15 cents.
- 929. Cottonseed Meal for Horses. Price, 5 cents.
- 985. System of Accounting for Cotton Ginneries. Price, 10 cents.
- 1030. Meade Cotton, and Upland Long-Staple Variety Replacing Sea Island. Price, 15 cents.
- 1056. Marketing Cottonseed for Planting Purposes. Price, 10 cents.
- 1111. One-Variety Cotton Communities. Price, 10 cents.
- 1135. Spinning Tests of Cotton Compressed to Different Densities. Price, 10 cents.
- 1153. Boll-Weevil Cotton in Texas. Price, 5 cents.
- 1204. Dusting Cotton from Airplanes. Price, 10 cents.
- 1219. Delinting and Recleaning Cottonseed for Planting Purposes. Price, 10 cents.

Bulletins marked "Free" may be obtained from the Office of Publications, U. S. Department of Agriculture, Washington, D. C., as long as the supply lasts. Those marked with a price may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., by remitting the cost in cash or money order at the time of ordering. (Postage stamps are not accepted.)

